

STEEL ARCH BRIDGE (Hennepin Avenue Bridge)  
Hennepin Avenue Spanning the West  
Channel of the Mississippi River  
Minneapolis  
Hennepin County  
Minnesota

HAER No. MN-18

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PHOTOGRAPHS

HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record  
National Park Service  
Rocky Mountain Regional Office  
Department of the Interior  
P.O. Box 25287  
Denver, Colorado 80225

HISTORIC AMERICAN ENGINEERING RECORD  
STEEL ARCH BRIDGE (Hennepin Avenue Bridge)

I. INTRODUCTION

Location: Spanning the West Channel of the Mississippi River at Hennepin Avenue, Minneapolis, Minnesota

Quad: Minneapolis South

UIM: A15/4981120/479160  
B15/4981190/479290

Date of Construction: North half in 1888, South half in 1891,  
(Modified in 1897, 1932 and 1954)

Present Owner: Hennepin County  
Hennepin County Government Center  
Minneapolis, Minnesota

Present Use: Vehicular and pedestrian bridge to be replaced by a new vehicular and pedestrian bridge. Projected date of removal in summer 1987.

Significance: The Steel Arch bridge falls within the boundaries of the nationally registered St. Anthony Falls Historic District. The bridge was built in two longitudinal halves. The north half was constructed in 1888 by the Keystone Bridge Company of Pittsburgh. This half has three, three-hinged solid arch ribs in each of the two spans. The south half was constructed in 1890 by the Wrought Iron Bridge Company of Canton, Ohio. The south half has three, two-hinged solid arch ribs in each of the two spans. The steel arch rib bridge is the third bridge at the location.

Historian: Kenneth Broas, Howard Needles Tammen & Bergendoff, February 1987

## II. ADMINISTRATIVE AND ECONOMIC HISTORY

In the decade beginning with the year 1880, Minneapolis and the agricultural community were recovering from the financial setbacks of panic and grasshopper times, and they began taking on metropolitan ways. [1] With the extension of the railroad through the territory, the city became the gateway to a great and expanding farming territory. Minneapolis literally exploded in population from a city of 47,000 in 1880 to 185,000 by 1890. The geographical growth of the city, the increase in industry, and massive increases in employment led to several public improvement problems, including the need for bridges to connect the two Divisions of the city across the Mississippi River.

By 1884, it became evident to the Minneapolis city council and the city engineer that the capacity of the 1875 suspension bridge across the Mississippi River was not adequate to meet the daily demands place upon it by a growing population. The suspension bridge, located in the heart of the business center of Minneapolis, was often crowded with teams and pedestrians, and it was obstructed by street railroad tracks. Also, the street railroad cars over the bridge necessitated a stronger span. [2]

After much discussion and public opinion on the location of a new replacement bridge, the city recommended in January 1885 that the new bridge be located where the present suspension

bridge exists. The city engineer estimated that the replacement bridge, a stone bridge, could be built in place of the suspension bridge at a cost of \$225,000. The bridge would be of sufficient dimensions to accommodate all the travel for a century to come. [3]

On 22 April 1885, Hennepin County had passed bills authorizing the issue of the necessary bonds to construct a replacement bridge to the suspension bridge. The County authorized the issue of \$300,000 in bonds to be used only for two bridges, \$120,000 for the South Minneapolis iron bridge and \$180,000 for the erection of piers and part of the roadway for an 80-foot-wide stone arch bridge to be built "above and adjoining" the suspension bridge. Hennepin County's course of action meant that the city must either consent to an 80-foot-wide stone arch bridge or else wait until the legislature met again and a new authorization could be obtained for a new bridge. The main reason for this course of action was that the suspension bridge would need an entirely new roadway during the next three years. [4] In the winter of 1885 the Minneapolis Council Special Committee on Legislation authorized the issue of \$250,000 in bonds for the construction of the bridge. [5]

There was widespread opposition to the proposed stone arch bridge that would include three piers in the river. The strongest opposition came from the milling industry and the "save the suspension bridge" group. The Milling Company was

concerned about reduced water power caused by the position of the piers in the river bed, while the "save the bridge" group was concerned about the destruction of such a beautiful structure.

In spite of the growing controversy, the city council authorized the construction of the stone arch bridge. On December 17, 1885, the city awarded a contract to Ring & Tobin to construct the substructure of the replacement bridge. [6] The east abutment of the stone arch bridge was under construction by December 21. On 14 January 1886, all work on the bridge was suspended. The Milling Company succeeded in obtaining a temporary injunction from the district court to stop all construction of the bridge. [7]

Between 14 January 1886 and 21 August 1886 the stone arch bridge was evaluated by the Board of U.S. Engineers, the City Engineer, and others to determine the impact the bridge piers would have on the water power of the stream and what damage the project would have on the government work at the falls. On 21 August 1886, the city requested and was granted a modification of the temporary injunction. The city had proposed to substitute for the stone arch bridge a steel arch with one pier in the middle of the river. [8] As to cost, City Engineer Rinker estimated that the steel arch bridge would be much less than the stone arch bridge.

By September, Ring & Tobin was back on the job, constructing the abutments they began in December of 1885. On about 3 December 1886, the city council awarded a contract to W.G. Coolidge & Company of Chicago to construct the center pier for the steel arch bridge for the sum of \$24,750. [9] On 28 January 1887 the city advertised for bids for the construction of the north 40 feet of the steel arch superstructure. Horace E. Horton, Rochester, Minnesota was awarded the contract on March 4 at the bid price of \$76,900. The award was made under the condition that the shopwork be done at the shops of the Keystone Bridge Company, Pittsburgh, PA. [10]

On 3 June 1888, the north one-half of the steel arch bridge was open for travel. The total cost of the partially completed bridge was \$187,613. The Engineer's estimate was \$180,000. [11]

From 3 June 1888 to about 13 January 1890, the north half of the steel arch bridge and the suspension bridge stood side by side, facilitating the transportation needs between the two divisions of the city. During the Exposition season in Minneapolis, (Fall of 1889), the city opened the steel arch bridge to carriage and light teams going to and from the Exposition. Heavy teams were ordered to take the suspension bridge. This event led Mr. Rinker to an examination of the suspension bridge in terms of its soundness to handle heavy teams. On Friday, September 20, Mr. Rinker reported to the city council that an examination of the suspension bridge was made and it was found unsafe for heavy

teams. The inspection revealed that the lower chords, together with many of the braces and floor beams, were badly decayed, rendering the suspension bridge uncertain as to the loads it will safely carry. Engineer Rinker recommended that the suspension bridge be either closed to travel or that heavily loaded teams be prohibited from crossing the bridge. [12] The recommendation was referred to the city's committee on roads and bridges with power to act. On September 27, the city council adopted the recommendation from the committee on roads and bridges, that no heavy travel be allowed to cross the suspension bridge and that other travel over the bridge be no faster than a walk. Also, the city engineer was directed to advertise for proposals for the removal and sale of the suspension bridge and for proposals for building the remaining portion of the steel arch bridge. [13]

On 4 October 1889, the Minneapolis Street Railway Company petitioned the city council to move their tracks from the suspension bridge to the roadway of the steel arch bridge. The request was granted, and by November 1 the car tracks were on the steel arch bridge.

Back in February, 1889, the city council ordered the cutting off of some improvements ordered for the year, which included bridge construction. To do all the improvements ordered, it was necessary for the city to issue bonds up to its limits of 5 percent of the assessed valuation allowed by the city. The

city's ways and means committee recommended against the issuing of bonds up to the charter limit. Doing so would not leave a dollar for contingent expenses. [14]

On 30 October 1889, the day after the city received bids to construct the second half of the steel arch bridge, the city's ways and means committee reminded the city council that there was no money available to pay for even half the cost of the bridge. [15] To reduce the tax burden on the city, it was the scheme of the roads and bridge committee to pay for half the work, approximately \$37,000, when the bridge was done in July or August of 1890 and the other half in February of 1891. The first half payment would come from the permanent improvement fund.

On November 19, the city executed a contract with the Wrought Iron Bridge Company, of Canton, Ohio, to construct the superstructure of the second half of the steel arch bridge for the sum of \$72,881. Due to budgetary problems, the city required in the contract that payment would be 50 percent of the contract price upon final completion of the bridge and the rest to be paid without interest after the Legislature met in January, 1891. [16] The first half payment would come out of the treasury after the June 1890 tax settlement was made. According to a report to the Minneapolis Tribune on 18 November 1889 from

Emerson Cole, chairman of the council ways and means committee, the method of paying for the bridge would not curtail any of the public improvements ordered for 1890.

To remove the suspension bridge, the city council on December 6 awarded a contract to Arthur McMullen and Company of Minneapolis for the sum of \$4,000. Their contract also included the building of the remaining portion of the substructure. [17]

By 15 January 1891, all that was left on the bridge was for the city to place the planking and concrete. The date of the official opening to the steel arch bridge was not found in either the Tribune or the Minneapolis Journal. Soon after the completion of the bridge, Bridge Engineer Cappelen ordered a count of the daily traffic across several bridges, including the steel arch. A summary of the general daily traffic over the bridges was published in the Minneapolis Tribune on February 7, 1891 and is included as Appendix C.

### III. THE STEEL ARCH BRIDGE

#### A. CONSTRUCTION CHRONOLOGY

The steel arch bridge over the natural channel of the Mississippi River began as a stone arch bridge on 21 December 1885. It was proposed that the new stone arch bridge would be constructed in two halves, the first half up-stream and adjoining the existing suspension bridge. Later, the suspension bridge would be removed and the second half or south side of the new 80-foot-wide bridge constructed.

The specifications for the stone arch bridge were completed by the city on 15 September 1885 with bids to be received no later than October 5. Five proposals were received, all higher than the City engineer's cost estimate of \$180,000 for a 40-foot-wide bridge and full width piers. In early November, the city council authorized the engineer to advertise for new bids. [18] The city engineer requested proposals for the substructure of the new stone arch bridge. On December 17, the Tribune reported that Ring & Tobin, low bidder on the substructure, was awarded a contract in the amount of about \$78,670 with provisions that the stone-cutting be done in Minneapolis.

Work on the excavation of the foundation for the east abutment at the island end of the stone arch bridge, later to be the abutment for the steel arch bridge, began on 21 December, 1885. Ring and

Tobin used Mankato limestone masonry at \$11.95 per yard. The stone was dressed in the Omaha yards near Fourth Avenue North along the river bank in Minneapolis. [19]

While moving dirt and stone for the bridge foundation, workers uncovered an old stone abutment of the first suspension bridge built in 1854, near the towers of the existing suspension bridge, built in 1875. [20]

Work on the substructure was stopped on 14 January 1886 by Judge Young of the district court. The Milling Company had succeeded in obtaining a temporary injunction to stop all construction on the bridge until a trial and a determination of action could be made by the court. It was the Milling Company's position that the construction of the three piers in the river bed would destroy the water power source of the milling industry. [7]

On 21 August 1886, after months of hearings, reviews, and discussions, City Attorney J. N. Cross made a motion in the district court to modify the temporary injunction issued by the Minneapolis Milling Company in December. The city proposed to substitute for the stone arch bridge a steel arch with one pier in the middle of the river. Judge Young approved the motion, [8] and by early September Ring and Tobin was back on the job. The abutments that were under construction before the injunction were completed and used for the steel arch bridge. On September 20, the first stone was laid for the bridge in the east abutment. [21]

The construction of the center pier began about December 3, after the city council awarded a contract to W.G. Coolidge & Company of Chicago. [9] The foundation of the center pier was constructed by the use of a pneumatic caisson and was completed on 14 April 1887. The masonry for the pier was completed on 12 May 1887. [21] The cost for the caisson and foundation on which the center pier was built was \$24,750. The cost of the stone work on the center pier and abutments was \$65,708.42. [22]

On 28 January 1887 the City of Minneapolis advertised for bids for the construction of the north 40 feet of the steel arch superstructure. Bids were based on plans and specifications supplied by the city engineer. Sealed bids were received and opened on February 21. Eleven bidders submitted proposals, ranging from \$53,000 to \$108,000. [23] Three bids were below the city engineer's estimated cost of the work. A list of companies and their bids appears in Appendix A.

On March 4, the contract to build the superstructure for the north 40 feet of the steel arch bridge was awarded to Horace E. Horton, Rochester, Minnesota, at the price bid of \$76,900. The award was made under the condition that the shopwork be done at the shops of the Keystone Bridge Company, Pittsburgh, PA. [10] C.L. Strobell, of Chicago, IL, Consulting Engineer of the Keystone Bridge Company, designed the superstructure. [24] Six months after letting the contract for the superstructure, the contract for the steel and iron had not been filled or delivered. According to the

Tribune, on 24 September 1887, City Engineer Rinker read a letter to the city council from G.W.G. Ferris, Keystone Bridge Company, explaining the delay in the delivery of the steel work. Ferris was acting as inspector of the steel work. According to Ferris, the delays were due to parts breaking on the machinery used in the rolling of the steel, failure to receive the metal wanted, and strikes. Mr. Ferris assured the council that everything was resolved and that the steel work would be completed in a few weeks.

The Tribune reported on 9 December 1887, that Mr. Horton, the contractor, and Mr. Strobell, the consulting engineer, were in the city to answer to an earnest "roast" from Mr. Rinker. Mr. Horton assured Mr. Rinker that the steel for the first span would be in Minneapolis in two weeks to 20 days, and that they would begin the erection of the false work for the spans within a week. The steel for the second span work would arrive in 30 days after the delivery of the first.

By 14 March, 1888, the arches of both spans were in position and the iron for the floor needed to be bolted together. The false-work under the east span had been removed, and workers had begun to remove the false-work under the west span. [22]

Bids were received from two contractors for paving the bridge. On 18 April 1888, the city awarded the paving contract to Thomas J. Canney, at the price of seventy-nine cents per square yard. [25]

The deck was paved with cedar blocks, laid on oak timbers at a cost of \$1500. The 12-foot sidewalk was laid in smoothed oak.

[21] The bridge contained lamp posts with incandescent electric lighting connected to the electric light plant in the City Hall.

[26] According to the Tribune, the bridge erection had been attended by good fortune; the iron had been placed without an accident.

3 June 1888 was the day that the "long delayed, steel arch bridge was thrown open for travel." The total cost of the bridge, which included full-width center pier and abutments at their base, and the north 40 feet of an 80-foot-wide bridge when complete at a future date, was \$187,613. The engineer's estimate was \$180,000. The total costs were divided as follows: masonry and foundation, including inspection, etc., \$102,238; superstructure, \$76,900; improvements in railing, \$300; lamps, \$95; paving, \$1500. [21]

For nearly one year and seven months, the north half of the steel arch bridge and the suspension bridge stood side by side, facilitating the transportation needs of the city across the Mississippi River. On 20 September 1889, Engineer Rinker reported to the city council that he had made an examination of the suspension bridge and had found it unsafe for heavy teams. On September 27, the city council ordered that no heavy teams be allowed to cross the suspension bridge, and that travel by others be no faster than a

walk. Also, the city engineer was directed to advertise for proposals for the removal and sale of the suspension bridge and for proposals for building the remaining portion of the steel arch bridge. [13]

Prior to advertising for bids for the second half of the steel arch bridge, the city engineer changed the bridge design and specifications. The first half of the steel arch bridge had a wood floor with three-hinge ribs and lacked stiffness. For the south half of the steel arch bridge, the specifications required the bidders to consider two alternative floor designs with the superstructure hinge only at the springs. One floor design was an oak timber floor similar to the first half; the other design was a buckle plate floor that would provide more stiffness to the bridge. [27]

On October 29, the city received and opened four sets of bids, as follows: for building that portion of the steel arch bridge on the site of the present suspension bridge (nine bids); for building that portion of the substructure for the proposed steel arch bridge as above (two bids); for removing the old suspension bridge, towers and anchorages (one bid); and for repairing the present suspension bridge (one bid). [28] A list of companies and their proposals appears in Appendix B.

The Mt. Vernon Bridge Company was low bidder for building that portion of the bridge on the site of the suspension bridge and was awarded the contract by the city. The company backed out. No reason could be found. On November 15, the city council passed a second resolution and approved on November 19, to award and order the execution of a contract for the construction of the superstructure to the Wrought Iron Bridge Company, Canton, Ohio. [16] The bid price was \$72,881. Due to budgetary problems in funding 1890 public improvement projects, the city required in the contract that payment would be 50 percent of the contract price upon the final completion of the contract and acceptance of the work not earlier than 1 July 1890, and the remaining 50 percent to be paid, without interest, in January 1891.

On December 6, the city council approved a resolution awarding and ordering the execution of a contract with Arthur McMullen and Company of Minneapolis for building the remainder of the substructure of the steel arch bridge and removing the suspension bridge for the sum of \$4,000. The suspension bridge became the property of the contractor. [17] Circa 13 January 1890, the contractor closed the suspension bridge to travel and began to remove the bridge, piece by piece. The Tribune reported on 28 June 1890, that the "work of tearing down the towers of the old suspension bridge is going rapidly onward." The towers were removed to a depth of two feet below the street grade, to allow for subgrading for the new pavement.

The date of arrival of the heavier material and the beginning of the construction of the south half superstructure was not found in the existing copies of the Tribune and Journal. It was reported in the Tribune on 28 June 1890 that "large quantity of lighter iron work for the steel arch has arrived, but the work on the superstructure is delayed due to the non-appearance of the heavier materials." In early August, City Engineer Rinker went to Pittsburgh to investigate the progress of the heavier materials for the superstructure. He found that the steel mill had not produced the arch or cord sections for the bridge. Rinker informed the city council that the contractor would begin the erection of the superstructure on about August 20, with completion in 40 to 60 days, depending on the shape of the materials delivered. The reasons for the delay of the heavy materials was not found; the date of completion was reset for 1 December 1890.

On 1 December 1890, Engineer Capellen, who was in charge of the bridge construction under Andrew Rinker, was ready to celebrate over the progress of the bridge. The last half of the bridge superstructure was completed on November 29, with the exception of the paving to be finished by December 4. The poles for the electric lines across the bridge had been installed and the street car tracks were ready for active service. Utilities were carried under the bridge in tubes, and included telephone and feed wires for the electric line. Although the bridge was completed circa December 6, and ready for travel, it was not fully equipped for

public travel. [29] The westerly approach to the bridge, which was under construction and being built by the Great Northern Company, would be completed in about two or three weeks.

According to Engineer Rinker, once the west side approach was completed, the city could complete the steel arch bridge. The few remaining things to do were to line up the northerly line of the bridge to extend even with the northerly line of Hennepin Avenue and to repave the first half of the bridge to conform with the new bridge. [30]

The iron work on the west side approach was completed on 15 January 1891. All that was left was for the city to place the planking and concrete. It was estimated that the steel arch bridge would be open for travel within two weeks. [31] Based on information in the Minneapolis Journal, dated 14 January 1891, it can be assumed that the steel arch bridge was open and fully in use for travel circa 1 February 1891.

On February 9, the first official traffic count across the steel arch bridge was reported. Bridge Engineer Cappelen ordered a count of the daily traffic to determine the daily strain and wear and to obtain other facts of importance to the engineering department. Cappelen found that 8000 teams crossed the bridge during an 11-hour time period. Due to the extent of the movement of wheeled vehicles on the bridge, it was impossible to keep any accurate record of pedestrians crossing the bridge. Also, 517

street car trips were made over the bridge in the 11-hour time period. A summary of the general daily traffic over the steel arch bridge and other bridges is included as Appendix C.

Total cost for the new half of the steel arch bridge was \$83,288. The city expended \$44,773.01 in 1890 with the balance to be paid in 1891 per the contract agreement with the Wrought Iron Bridge Company. The total construction cost of the steel arch bridge was \$273,428, which included several extras that were not in the original estimate in 1886. The original estimate, done by the city engineering department in 1886 was \$246,000. [32] The extras included buckle plate floor, lamp posts, rip rap, additional fill material for the east approach, and concrete.

#### B. MODIFICATIONS

Three known major alterations were made to the bridge since its completion in 1891. Each alteration attempted to improve the bridge stability, and it improved vehicular travel and reduced maintenance cost. In order to keep pace with increased loads introduced first by streetcars, teams, and pedestrians, then later by buses, trucks, and automobiles, the deck was strengthened by replacing an older deck with a newer and stronger one.

The first major repair work took place in the summer of 1897 with the installment of buckle plates and a new paving job to the north half of the bridge. This was done to stabilize the north

half and to match the south half in design. The city instructed the city engineer, F.W. Cappelen, to buy the brick and employ the necessary labor to pave the steel arch bridge as outlined in the engineer's report. [33]

The exact date of the second major repair was not found, but was referenced in the Minneapolis Star on 1 December 1953 and again on 18 May 1954. Circa 1932 the original brick paving over the bridge was replaced with timber flooring overlaid with asphalt.

In 1954, Hennepin County and the City of Minneapolis significantly altered the appearance of the deck of the steel arch bridge. The timber flooring and asphalt, originally laid in about 1932 was replaced by an open-type steel deck, also referred to as an I-beam Lok flooring. The streetcar tracks over the bridge were removed. Other improvements like concrete curbing, pipe guard rails, and new lamp posts were added. The cost of repairs was under \$200,000, with the city paying about 7 percent and the county paying 93 percent of the cost.

#### IV. BIOGRAPHIES

##### A. ANDREW RINKER (1849-19??)

Andrew Rinker was born April 15, 1849, at Philadelphia, Pennsylvania, son of Francis and Elizabeth Rinker. He received his early educational training in the common schools and graduated at the Philadelphia High School. At age eighteen, he entered the Ninth District Survey office in Philadelphia and was employed there in the Philadelphia Registry Bureau until June, 1871, when he became assistant city engineer of Minneapolis. In April, 1877, Mr. Rinker was appointed city engineer of Minneapolis and held the position nearly 16 years. On January 1, 1893, he formed the firm of Rinker & Hoff, consulting and constructing engineers, a partnership which continued until 1896, when Mr. Rinker accepted the position of engineer, secretary and treasurer of the Great Falls Water Power & Town Site Company. He held this position until October, 1902. On January 5, 1903, Mr. Rinker was reappointed city engineer of Minneapolis, which office he has held since. During his connection with the engineering department nearly all of the public improvements now existing were inaugurated and carried to completion, involving the expenditure of millions of dollars. Mr. Rinker was married in September, 1876, to Susan E. Johnson, and to them have been born three children — Florence E., Charles II, and Dorothy.

Source: A Half Century of Minneapolis, The Hudson Publishing Company, 1908. p. 506.

B.   FREDERICK WILHELM CAPPELEN (1858-1921)

Frederick Cappelen served as bridge engineer for the City under Andrew Rinker during the construction of the steel arch bridge. He was born on 21 October 1857, in Drammen, Norway, and was educated at the Technical and Mining School of Oerrebro, Sweden, and at the Royal Polytechnicum in Dresden, Germany. Cappelen came to the United States in 1880 and worked for the Northern Pacific Railway until 1886.

Andrew Rinker named Cappelen his assistant in 1886, in charge of the bridge department. He retained this position up to his appointment of city engineer in 1892. He was city engineer from 1892 to 1898 and again from 1912-1921. His last bridge as city engineer, completed in 1923, was the Franklin Avenue (Cappelen Memorial) bridge in Minneapolis. The bridge had a then-record 400-foot concrete arch center span. [34]

V. FOOTNOTES

1. Holcomber, Maj. R. I., hist.ed., Compendium of History and Biography of Minneapolis and Hennepin County, Minnesota, p.140.
2. Atwater, Isaac, ed., History of the City of Minneapolis - Part I, p. 351.
3. Minneapolis Tribune, 27 January 1885.
4. Ibid., 22 April 1885.
5. Ibid., 5 January 1886.
6. Ibid., 17 December 1885.
7. Ibid., 15 January 1886.
8. Ibid., 22 August 1886.
9. City of Minneapolis, City Council Proceedings, 3 December 1886.
10. Ibid., 4 March 1887.
11. Minneapolis Tribune, 3 June 1888.
12. City of Minneapolis, City Council Proceedings, 20 September 1889.
13. Ibid., 27 September 1889.
14. Minneapolis Tribune, 27 February 1889.
15. Ibid., 31 October 1889.
16. City of Minneapolis, City Council Proceedings, 19 November 1889.
17. Ibid., 6 December 1889.
18. Minneapolis Tribune, 6 November 1885.
19. Ibid., 19 December 1885.
20. Ibid., 28 December 1885.
21. Ibid., 3 June 1888.
22. Ibid., 14 March 1888.
23. Ibid., 22 February 1887.

24. "The Minneapolis Steel Arch Bridge", The Engineering and Building Record, May 10, 1890, V. 21, p. 58.
25. City of Minneapolis, City of Council Proceedings, 18 April 1888.
26. Ibid., 28 September 1888.
27. Minneapolis Tribune, 30 October 1889.
28. City of Minneapolis, City Council Proceedings, 1 November 1889.
29. Minneapolis Tribune, 2 December 1890.
30. Ibid., 5 December 1890.
31. Minneapolis Journal, 14 January 1891.
32. City Engineer Minneapolis, Bridge Design Notes 1886-87, P. 203 & P. 240.
33. City of Minneapolis, City Council Proceedings, 9 July 1897.
34. Broadway Bridge, HAER No. MN-2, pp. 13 & 14.

VI. BIBLIOGRAPHY

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B. PERIODICALS

Douglas, W.J. "The Minneapolis Plate-Girder Arch Bridge," The Engineering Record, 50 (December 17, 1904), 728.

"The Minneapolis Steel Arch Bridge," The Engineering and Building Record, 21 (May 10, 1890), 58.

C. NEWSPAPERS

1. HISTORY

a. Construction

Minneapolis Journal, 16 November 1887.

\_\_\_\_\_, 14 January 1891.

Minneapolis Tribune, 12 September 1885.

\_\_\_\_\_, 6 November "

\_\_\_\_\_, 21 " "

\_\_\_\_\_, 17 December "

\_\_\_\_\_, 19 " "

\_\_\_\_\_, 28 " "

\_\_\_\_\_, 5 January 1886.

\_\_\_\_\_, 25 November "

\_\_\_\_\_, 10 December "

\_\_\_\_\_, 5 January 1887.

\_\_\_\_\_, 28 " "

\_\_\_\_\_, 22 February "

\_\_\_\_\_, 24 September "

\_\_\_\_\_, 9 December "

\_\_\_\_\_, 14 March 1888.

\_\_\_\_\_, 2 June "

\_\_\_\_\_, 3 " "

\_\_\_\_\_, 26 September 1889.

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Minneapolis Tribune, 30 October 1889.

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\_\_\_\_\_, 28 June "

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\_\_\_\_\_, 26 March "

\_\_\_\_\_, 18 May "

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\_\_\_\_\_, 7 August "

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\_\_\_\_\_, 22 " "

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\_\_\_\_\_, 8 October "

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\_\_\_\_\_, 31 " "

\_\_\_\_\_, 7 February 1891

c. Location

Minneapolis Tribune, 27 January 1885.

\_\_\_\_\_, 10 February "

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1 December 1953.

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September 1954.

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CITY ENGINEER'S OFFICE  
MINNEAPOLIS, Minn. March 4, 1887. }

To the Honorable City Council, City of Minneapolis:

Gentlemen—I herewith submit schedule of proposals received for building the superstructure of the proposed steel arch bridge, adjoining the suspension bridge. Said proposals were opened in presence of your Committee on Roads and Bridges.

Respectfully submitted,

ANDREW RINKER,

City Engineer.

The following is the schedule.

Name of Bidder.	Amount.
Minneapolis Bridge Co. (C. P. Jones, President).....	\$76,500.00
W. G. Coolridge & Co.....	78,220.00
Keepus & Riddell.....	84,374.80
Keystone Bridge Co.....	79,900.00
Horace E. Horton.....	79,900.00
King Bridge Co.....	75,000.00
Smith Bridge Co.....	53,000.00
Morse Bridge Co.....	59,023.00
Wrought Iron Bridge Co.....	64,000.00
Shiffler Bridge Works, design No. 1.....	73,800.00
Shiffler Bridge Works, design No. 2.....	79,000.00
A. Gottlieb & Co.....	108,364.00

Referred to the Committee on Roads and Bridges.

From Andrew Rinker, City Engineer, the following:

Minneapolis, Nov. 1st, 1889.

To the Honorable City Council:

Gentlemen—

I submit hereto attached schedule of proposals for building the superstructure of the remaining half of the steel arch bridge, the superstructure of the steel arch, the repair of the suspension bridge and for the removal of the suspension bridge, viz:

Steel arch super-structure. Oak Buckle floor. plate floor

The Milwaukee Bridge & Iron Works, by L. H. Johnson, agent .....\$69,750 \$73,705

The Mt. Vernon Bridge Company, by W. W. Curtiss, agent ..... 59,988 67,893

King Iron Bridge & Manufacturing Company, by C. E. H. Campbell, agent ..... 61,999 74,800

The Wrought Iron Bridge Company, of Canton, Ohio, by J. Wall, agent..... 65,422 72,831

Shiffler Bridge Works, by O. Hoff, agent ..... 69,400 78,300

Keystone Bridge Company, by C. L. Strobel, agent..... 74,900 83,900

Chicago Bridge & Iron Company, by Horace E. Horton, President ..... 64,994 72,994

Smith Bridge Company, by S. M. Hewett, agent ..... 69,875 73,500

A. Y. Bayne, agent Massillon Bridge Company, bid as follows:  
Iron and steel, per pound, \$4.75. Lumber in place, \$28.00 per 1,000 feet B. M. Railing, \$2.35 per lineal foot.

To repair the suspension bridge: By Olaf Hoff, \$17,800.

Substructure steel arch, by the Minnesota Stone Co.:  
Mankato masonry, \$9.98 per cubic yard.  
Excavation old masonry, \$1.00 per cubic yard.

Excavation of earth, 55 cents per cubic yard.

Excavation of white sandrock, \$5.00 per cubic yard.

Two granite blocks (total), \$250.00.  
Total cost, \$11,223.14.

By Morris & Foley:  
Mankato masonry, \$9.25 per cubic yard.  
Earth excavation, 26 cents per cubic yard.  
White sandrock excavation, 95 cents per cubic yard.

Old masonry excavation, 75 cents per cubic yard.  
Granite masonry, \$40.00 per cubic yard.  
Total cost, \$10,172.35.

A. McMullen & Co., of Minneapolis, proposes to remove the suspension bridge, towers and anchorages and to build the substructure of the steel arch bridge upon the site of the old suspension bridge for the sum of \$4,000 for the entire work as above, and the material in the suspension bridge to be the property of A. McMullen & Co.

Respectfully submitted,

ANDREW RINKER,

City Engineer.

Referred to Committee on Roads and Bridges.

From The City Council Proceedings  
1 November 1889

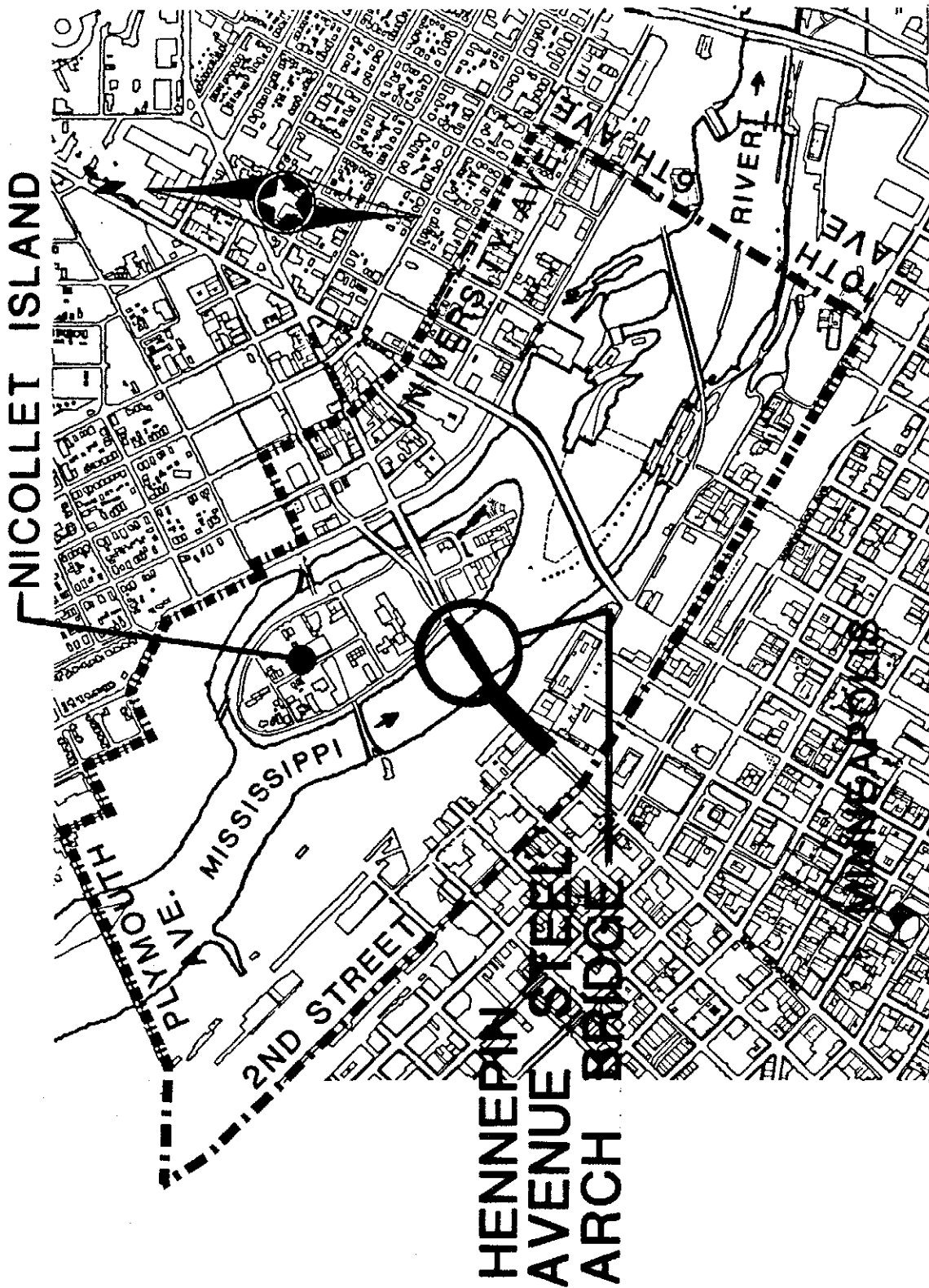
DAILY TRAFFIC ACROSS SEVERAL BRIDGES  
IN MINNEAPOLIS IN 1891


In the case of the steel arch bridge this count was continued for 11 hours only; but on the others it continued from 7 a.m. until 7 p.m. Owing to the extent of the movement of wheeled vehicles on the steel arch it was impossible to keep any accurate record of the number of foot passengers each way. The following summary gives a good general indication of the general daily traffic over these structures:


	TEAMS	STREET CARS	PEDESTRIANS
Twentieth Avenue North -----	564	---	865
Steel Arch Bridge -----	8000	517	---
Plymouth Avenue -----	842	---	---
Tenth Avenue South -----	889	---	1,726
Washington Avenue South -----	451	142	467
Totals, (four bridges)	10,746	659	3,042

It is to be regretted that the record of foot passengers is incomplete, but assuming that they are in the proportion of four to each team (which is considered a moderate estimate), there are 42,864 trips on foot made across four bridges each day, and this figure would be materially enlarged by the returns from the two bridges not included in the list. The number of street cars passing daily from one side of the river to the other will be something of a surprise to the majority of people. This total will be largely increased when the electric service goes into operation.

Source: Minneapolis Tribune, 7 February, 1891.



 St. Anthony Falls Historic District

 Hennepin Avenue Bridge



ST. ANTHONY FALLS  
HISTORIC DISTRICT

MINNESOTA-HENNEPIN CO.

7.5 MINUTE SERIES (TOPOGRAPHIC)

**1000-meter Universal Transverse Mercator grid ticks, zone 15**

